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APPLICATION NUMBER: *60/505,193*
FILING DATE: *September 23, 2003*
RELATED PCT APPLICATION NUMBER: *PCT/US04/31167*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US60/505,193*

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a r quest for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Michael E.	Reck	15 Pearl Street, Belmont MA

☐ *Additional inventors are being named on the____ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

ISOLATION VALVE

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

☒ Customer Number **21710** →

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☒ Firm or Individual Name	BROWN RUDNICK BERLACK ISRAELS LLP				
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Address	18th Floor, Box IP				
City	Boston	State	MA	ZIP	02111
Country	US	Telephone	617-856-8200	Fax	617-856-8201

ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* **7**

☒ Drawing(s) *Number of Sheets* **5**

☐ Application Data Sheet. See 37 CFR 1.76

☐ CD(s), Number

☒ Other (specify) **Appendix A 20 pages**
Express Mail No. EV 304 693 274US

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☒ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

☒ The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number **500369**

☐ Payment by credit card. Form PTO-2038 is attached.

FILING FEE AMOUNT ($) **$80.00**

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE Brian Michaelis

Date **9/23/2003**

TYPED or PRINTED NAME **Brian L. Michaelis**

REGISTRATION NO. *(if appropriate)* **34,221**

Docket Number: **1171/7**

TELEPHONE **617-856-8369**

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CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR §1.10)

Docket No. 1171/7

APPLICANT(S):

Michael E. Reck

TITLE OF THE INVENTION:

ISOLATION VALVE

FILING DATE: HEREWITH

APPLICATION NUMBER (if known): UNKNOWN

MAIL STOP PROVISIONAL PATENT APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that the following correspondence:

This Certificate of Mailing (1 pg.); Small Entity Assertion (1 pg.); Provisional Application for Patent Cover Sheet (1 pg.); Specification (8 pgs., including title page); informal drawings (5 pgs.); Appendix A (20 pgs., including cover page).

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 in an envelope addressed to: MAIL STOP PROVISIONAL PATENT APPLICATION, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on:

September 23, 2003
Date

Judy Daley
Person Mailing Correspondence

Judy Daley
Signature

EV 304693274 US
Express Mail No.

#1229737 - 1171/7

APPLICATION FOR PATENT (Small Entity Assertion)

Docket No. 1171/7

INVENTOR(S): Michael E. Reck

TITLE OF THE INVENTION: ISOLATION VALVE

FILING DATE: HEREWITH

Serial Number (if known): UNKNOWN

MAIL STOP PROVISIONAL PATENT APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SMALL ENTITY ASSERTION

Sir:

Applicant(s) claim small entity status under 37 CFR 1.27 for the above-identified patent application.

Respectfully Submitted,

Date: 9-23-03

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PROVISIONAL PATENT APPLICATION

ENTITLED:

ISOLATION VALVE

Inventor(s):

Michael E. Reck

CERTIFICATE OF EXPRESS MAILING

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Express Mail No.: EV 304 693 274 US

By: Judy Daley

Judy Daley

September 23, 2003

Date

Docket No. 1171/7

ISOLATION VALVE

FIELD OF THE INVENTION

This invention relates generally to isolation valves, and more particularly to isolation valves for an in-line appliance.

BACKGROUND OF THE INVENTION

Isolation valves are well known and are traditionally used in plumbing and heating applications to control the flow of water or other fluid to and from an in-line appliance or piece of equipment for purposes of maintenance, replacement or repair. Unfortunately however, current designs are large and bulky and do not allow for a full fluid flow. This is undesirable for many reasons. In-line appliances are typically disposed in limited spaces, thus the large bulky size of current designs make them cumbersome and difficult to install in limited spaces. In some cases the limited space makes them impossible to install, remove and/or repair. Furthermore, some in-line appliances, e.g. tankless water heaters, are tested by fluid flow rates and temperature calculations. Disadvantageously, the partial fluid flow capability of current designs makes it difficult for the in-line appliance to be accurately tested.

SUMMARY OF THE INVENTION

A fluid isolation valve is provided having a valve body with a first fluid flow port, a second fluid flow port and a fluid drain port. The valve body also defines a fluid flow channel, a drain flow channel and a valve portion, wherein the valve portion is disposed in the valve body to be communicated with the first fluid flow port, the second fluid flow port and the fluid drain port. A flow diversion device is also provided and is disposed within the valve portion. The flow diversion device is configurable between a first configuration and a second configuration, such that when the flow diversion device is in the first configuration the first fluid flow port is

communicated with the second fluid flow port. Consequently, when the flow diversion device is in the second configuration the first fluid flow port is communicated with the fluid drain port.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other features and advantages of the present invention will be more fully understood from the following detailed description of illustrative embodiments, taken in conjunction with the accompanying drawing in which:

Fig. 1 is a perspective view of a first embodiment of a hot water isolation valve according to the invention in a first configuration;

Fig. 2 is a perspective view of the hot water isolation valve of Fig. 1 in a second configuration;

Fig. 3 is a perspective view of a second embodiment of a cold water isolation valve according to the invention in a first configuration;

Fig. 4 is a perspective view of the cold water isolation valve of Fig. 3 in a second configuration; and

Fig. 5 is a diagrammatic representation of a tankless water heater disposed between a water source and a plumbing system.

DETAILED DESCRIPTION

Referring to Fig. 1, a hot water isolation valve 100 is shown and includes a first hot water port 102, a second hot water port 104, a hot water relief port 106 and a hot water drain port 108. Hot water isolation valve 100 defines a hot water flow channel 101 and a hot water drain channel 103. The hot water flow channel 101 provides fluid communication between the first hot water port 102 and the second hot water port 104. The hot water drain channel 103 provides fluid communication between the first hot water port 102 and the hot water drain port 108. The hot water isolation valve 100 includes a flow diversion device (not shown), such as a ball valve, disposed within a valve portion 110 disposed between first hot water port 102, second hot water port 104, hot water relief port 106 and hot water drain port 108. Moreover, the flow diversion

device is configurable between a first configuration and a second configuration via a flow adjustment means 112, such as a butterfly handle. In Fig. 1, the flow diversion device is shown in a first configuration wherein hot water flow is between first hot water port 102 and second hot water port 104. In Fig. 2, the flow diversion device is shown in a second configuration wherein hot water flow is between first hot water port 102 and hot water drain port 108. It should be noted that hot water relief port 106 includes a threaded portion (female) for receiving a hot water relief valve. However, although hot water relief port 106 is shown having a threaded (female) portion, it should be appreciated that hot water relief port 106 may be configured for connecting with a hot water relief valve in any manner suitable to the desired end purpose, such as a threaded portion (male), a friction fit connector, a crimped connector, a clamped connector, a quick disconnect connector, or the like.

Referring to Fig. 3, a cold water isolation valve 200 is shown and includes a first cold water port 202, a second cold water port 204 and a cold water drain port 206. Cold water isolation valve 200 defines a cold water flow channel 201 and a cold water drain channel 203, wherein cold water flow channel 201 is disposed to communicate first cold water port 202 with second cold water port 204 and wherein cold water drain channel 203 is disposed to communicate first cold water port 202 with cold water drain port 206. Cold water isolation valve 200 also includes a flow diversion device, such as a ball valve, disposed within a valve portion 208. Valve portion 208 is disposed between first cold water port 202, second cold water port 204 and cold water drain port 206. Moreover, the flow diversion device is configurable between a first configuration and a second configuration via a flow adjustment means 210. In Fig. 3, the flow diversion device is shown in a first configuration wherein cold water flow is between first cold water port 202 and second cold water port 204. In Fig. 4, the flow diversion device is shown in a second configuration wherein cold water flow is between second cold water port 204 and cold water drain port 206.

Referring to Fig. 5, a typical in-line appliance set up is shown and includes a tankless water heater 300 connected between a water source 302 (such as a well or water main) and a plumbing system 304 (such as a plumbing system supplying a building), wherein tankless water heater 300 includes a first tankless water port 306 and a second tankless water port 308.

Referring to Figs. 1-5, cold water isolation valve 200 is connected to water source 302 via first cold water port 202 and tankless water heater 300 via second cold water port 204 which is connected to first tankless water port 306. When the flow diversion device of cold water isolation valve 200 is in the first configuration, cold water is allowed to flow from water source 302, into first cold water port 202, through the cold water flow channel 201, out of second cold water port 204 and into first tankless water port 306. As discussed above, when the flow diversion device of cold water isolation valve 200 is in the second configuration, the flow path of cold water isolation valve 200 is between cold water drain port 206 and second cold water port 204 to facilitate draining the cold water side of the system. In the second position or configuration of the cold water isolation valve 200 the cold water is prevented from flowing into tankless water heater 300 via first cold water port 202. A cold water drain flow stop 212 (Fig. 3) may be provided for sealing off cold water drain port 206, thus completely preventing cold water from flowing through cold water isolation valve 200.

Hot water isolation valve 100 is connected to tankless water heater 300 via second tankless water port 308 which is connected to first hot water port 102. Additionally, hot water isolation valve 100 is connected to plumbing system 304 via second hot water port 104. When the flow diversion device of hot water isolation valve 100 is in the first configuration, hot water is allowed to flow from second tankless water port 308, into first hot water port 102 through the hot water flow channel 101, out of second hot water port 104 and into plumbing system 304. When the flow diversion device of hot water isolation valve 100 is in the second configuration, hot water is allowed to flow from second tankless water port 308, into first hot water port 102 through the hot water drain channel 103 and out of hot water drain port 108 to facilitate draining the hot water side of the system (and emptying the tank). Water is likewise prevented from flowing into plumbing system 304. A hot water drain flow stop 114 (Fig. 1) may be provided for sealing off hot water drain port 108, thus preventing water from flowing through hot water isolation valve 100.

This above described design advantageously allows for tankless water heater 300 and/or plumbing system 304 to be drained or flushed out. For example, when the flow diversion device of cold water isolation valve 200 is in the second configuration ,a flushing device containing a

flushing fluid, such as water or chemical solvent, may be connected to cold water drain port 206 to inject the flushing fluid into cold water drain port 206. The flushing fluid will flow through cold water drain channel 203, out of second cold water port 204, into first tankless water port 306 and through tankless water heater 300. The flushing fluid will then flow out of second tankless water port 308 and into first hot water port 102. If the flow diversion device of hot water isolation valve 100 is in the second configuration, the allowable flow path of the flushing fluid is between first hot water port 102 and hot water drain port 108, advantageously allowing tankless water heater 300 to be flushed. It should be appreciated that the above described flushing may also be performed in a reverse manner using hot water drain port 108 as an inlet flow port and cold water drain port 206 as an outlet flow port.

It is contemplated that one objective of this valve is to isolate the cold water feed and the hot water piping to a plumbing system so that the water heater can be replaced. These tankless on-demand water heaters typically mount onto a wall with 4 screws. To replace the unit, the valves can be shut off, the unions (e.g. first hot water port 102 and second cold water port 204) disconnected and the water heater removed from the wall. The drain valves will be used to test the system and flush out the water heater with chemicals when the feed and hot water supply is shut off. A pressure relief valve (not shown) threaded into the hot water isolator valve will always be open to the water heater no matter what position the ball is in because the hole will be opposite the stem.

This new design will advantageously save space and time and offer a full fluid flow. The full fluid flow of the drain is important because the hot water heater is tested by fluid flow and temperature calculation. Moreover, space is also critical because these units are installed in small spaces. This design is less than half the length of current designs advantageously allowing these new isolation valves to be used in small spaces.

A cold water isolation valve and a hot water isolation value may be packaged together. Moreover, it should be appreciated that any size valve and configuration suitable to the desired end purpose may be used.

It should be appreciated that first hot water port 102 and second cold water port 204 are union connections, as is known in the art, for connecting hot water isolation valve 100 and cold water isolation valve 200 to tankless water heater 300.

Although an exemplary embodiment of hot water isolation valve 100 and cold water isolation valve 200 includes a forged brass construction, hot water isolation valve 100 and cold water isolation valve 200 may be constructed, in whole, in part or in combination, using any material suitable to the desired end purpose, such as cast brass, copper, iron, plastic and/or a composite material, such as polycarbonate. Moreover, although connections between hot water isolation value 100, cold water isolation valve 200, plumbing system 304 and tankless water heater 300 are shown as threaded screw type connections, it should be appreciated that these connections may be any connections suitable to the desired end purpose, such as friction fit connectors, crimped connectors, clamped connectors, quick disconnect connectors, or the like.

Although the invention has been shown and described with respect to exemplary embodiments thereof, various other changes, omissions and additions in the form and detail thereof may be made therein without departing from the spirit and scope of the invention.

We claim:

1. A fluid isolation valve comprising:

a valve body, said valve body having a first fluid flow port, a second fluid flow port and a fluid drain port, wherein said valve body defines a fluid flow channel, a drain flow channel and a valve portion, said valve portion being disposed to be communicated with said first fluid flow port, said second fluid flow port and said fluid drain port; and

a flow diversion device disposed within said valve portion, said flow diversion device

being configurable between a first configuration and a second configuration, such that when said flow diversion device is in said first configuration said first fluid flow port is communicated with said second fluid flow port and when said flow diversion device is in said second configuration said first fluid flow port is communicated with said fluid drain port.

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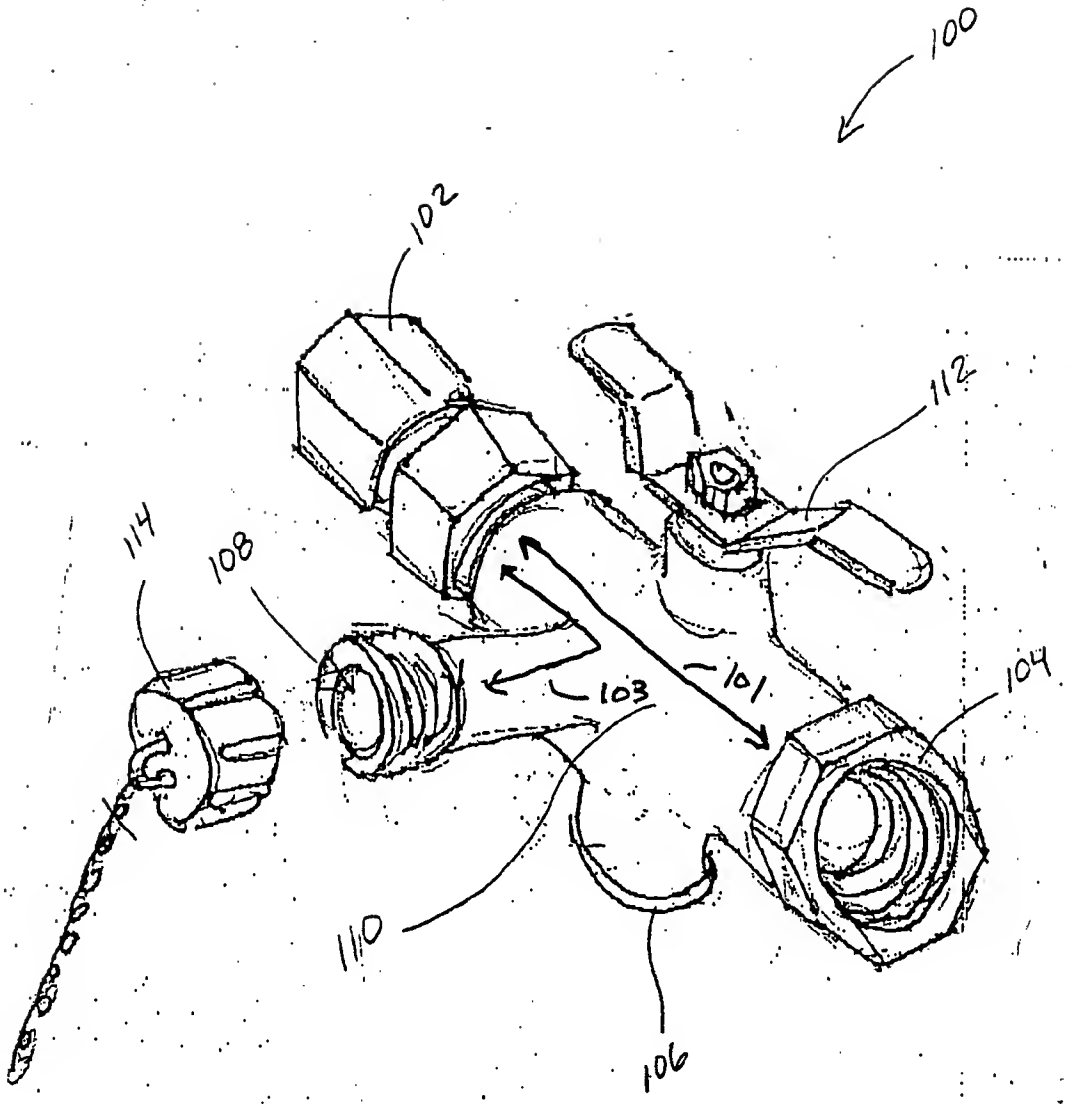

FIGURE 1

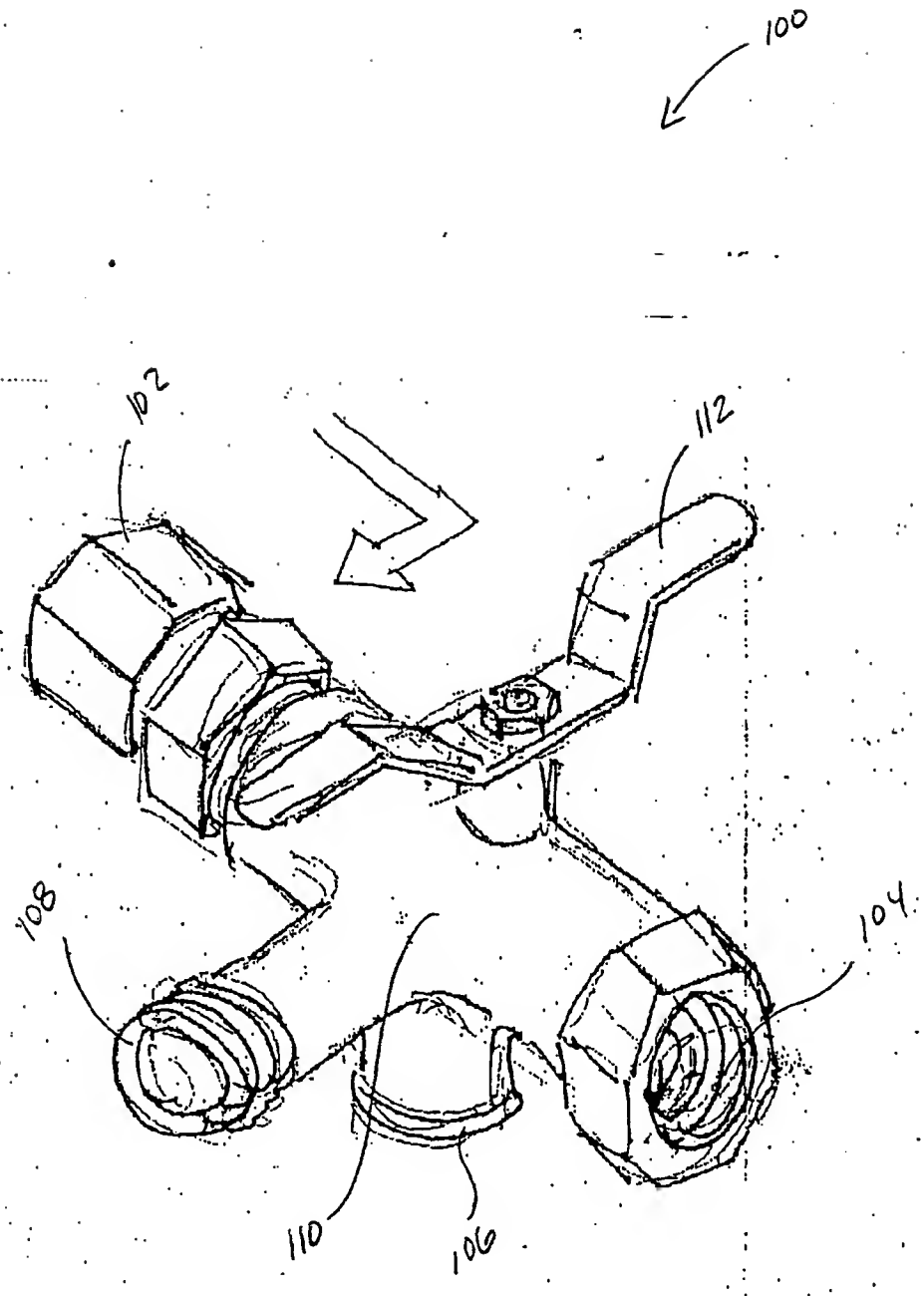

FIGURE 2

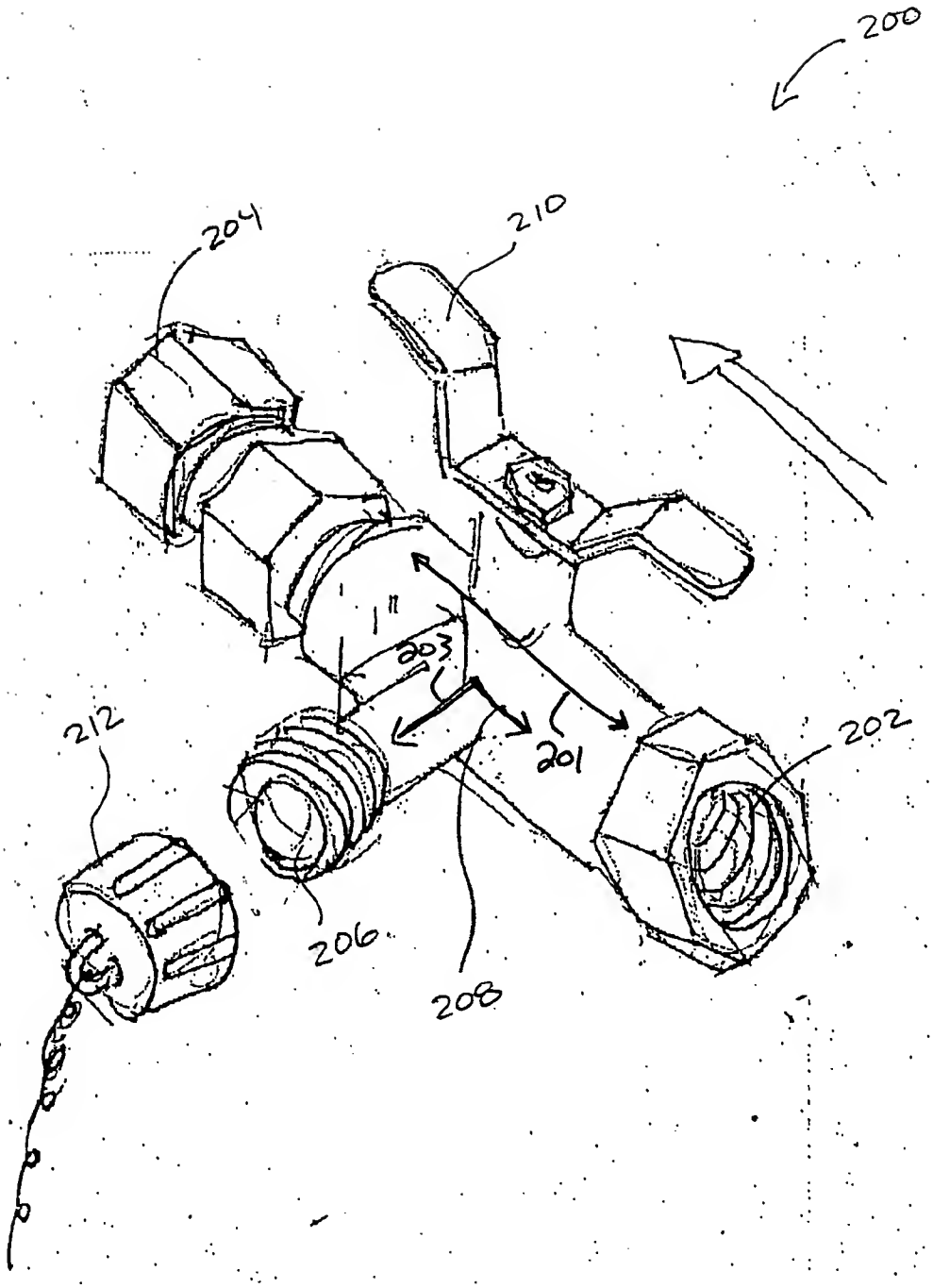

FIGURE 3

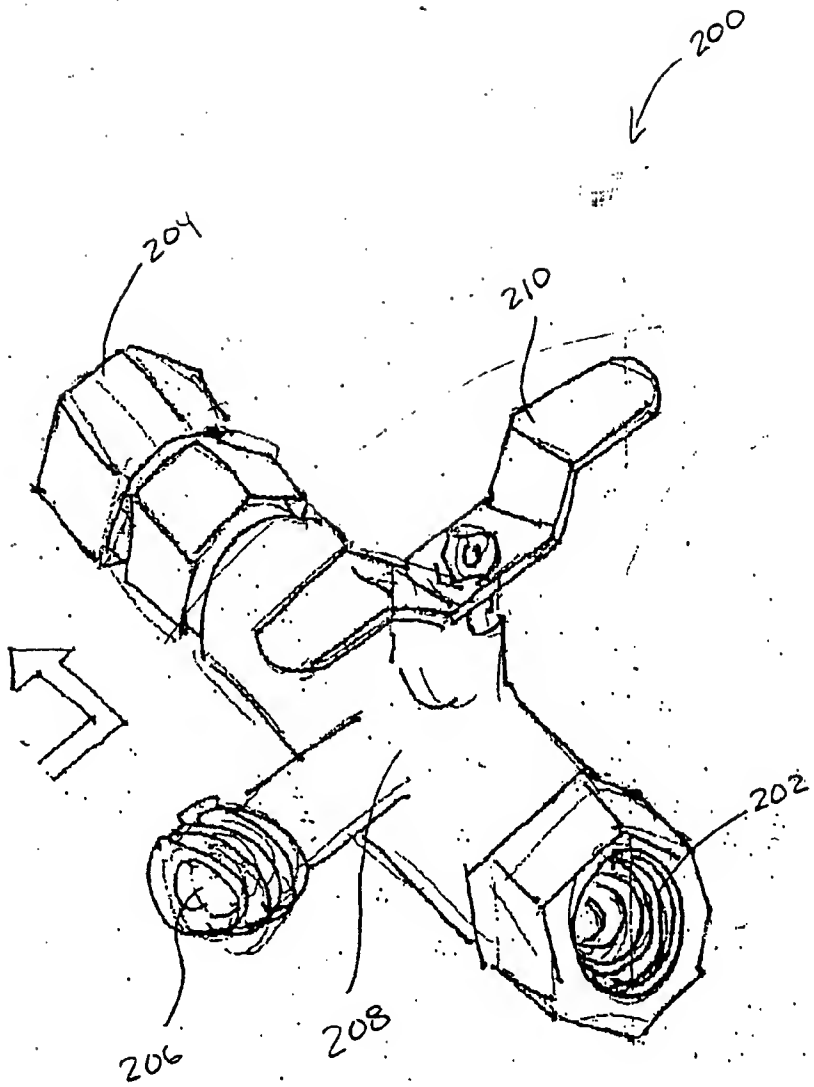

FIGURE 4

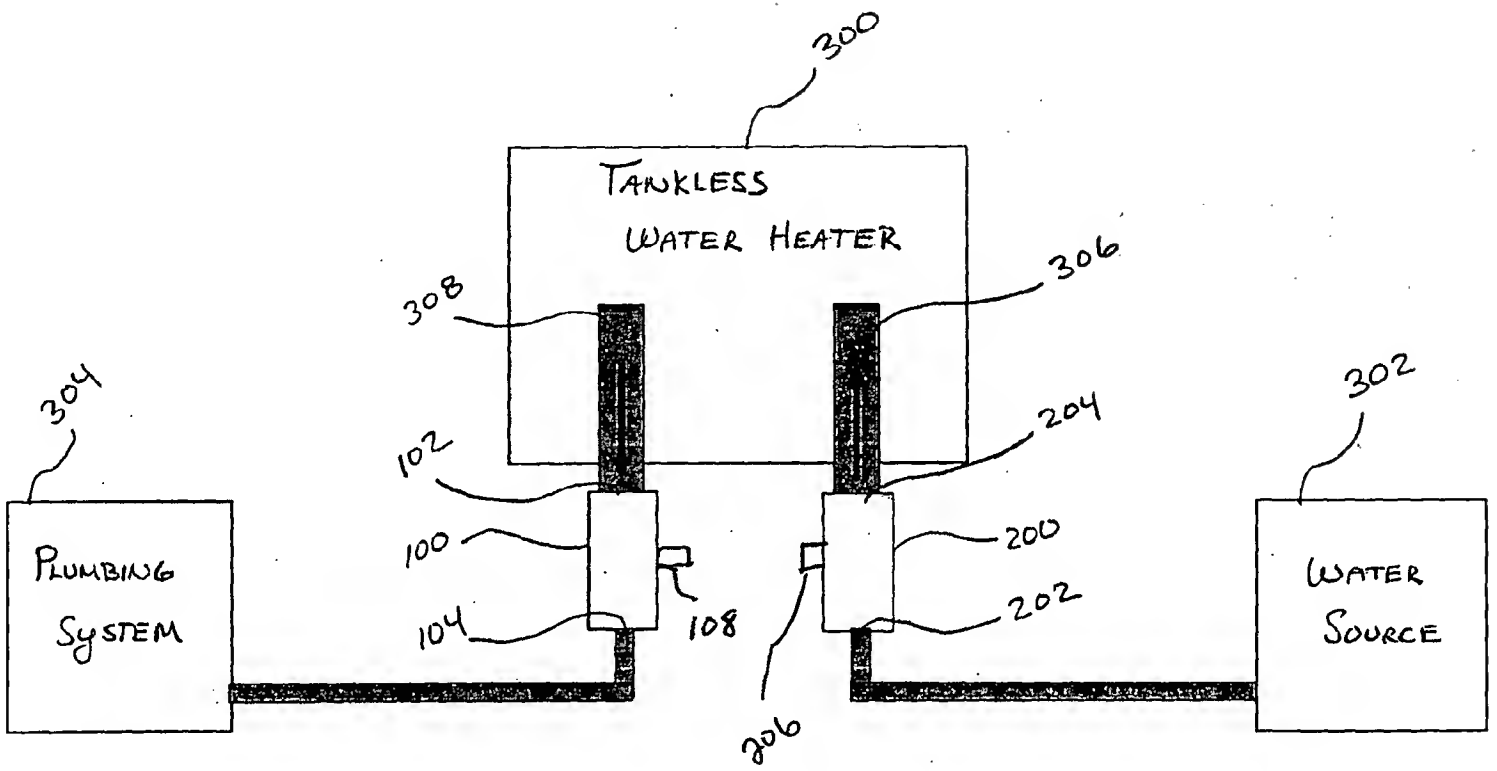
300
TANKLESS
WATER HEATER
308
306
304
302
102
204
100
200
PLUMBING
SYSTEM
104
108
202
206
WATER
SOURCE

FIGURE 5